

IN THE CLAIMS:

Please amend the claims to read as follows:

1. (Amended) A dielectric resonator comprising:

2 a dielectric block having a generally rectangular parallelepiped shape, wherein at least two edges of said dielectric block are chamfered in a manner to provide a coupling of three resonant modes of said dielectric block.

wherein a first chamfered edge is parallel to a y-axis, a second chamfered edge is parallel to a z-axis, and said first chamfered edge does not intersect said second chamfered edge.

3 2. (Original) A dielectric filter characterized in disposing at least one dielectric resonator claimed in claim 1 in a cut-off waveguide.

4 3. (Amended) A dielectric filter claimed in claim 2 characterized in disposing two or more of said dielectric resonators in said cut-off waveguide and providing a partition comprising a conductive material between said dielectric resonators.

5 4. (Previously Amended) A dielectric filter claimed in claim 2 characterized in disposing a metal rod contacting with said cut-off waveguide by one end in parallel with a side surface of said dielectric resonator in the position distant by a predetermined amount from said side surface and having a composition in which resonant frequency of each resonance and an amount of coupling between resonance is adjustable.

5. (Currently Amended) A dielectric filter claimed in claim 2, 3, ~~or 4~~, further comprising a second resonator in said cut-off waveguide, said second resonator being a type different than that described in claim 1.

6. (Previously Amended) A dielectric resonator in which three resonant modes of a dielectric block of a generally rectangular parallelepiped are coupled, wherein said block has three planes formed by chamfering three ridge portions of said dielectric block, respectively, said three chamfered ridges not being parallel to each other.

7. (Original) A dielectric resonator claimed in claim 6 characterized in that said dielectric block is mounted in a cut-off waveguide of a generally rectangular parallelepiped.

8. (Previously Amended) A dielectric resonator comprising a dielectric block in the form of a generally rectangular parallelepiped having three-ridge portions chamfered thereof and generating TE₀₁ δ mode on electro-magnetically independent three surfaces of said dielectric block and having three surfaces of A1, A2, A3 (hereafter called surfaces A) formed by chamfering three ridge portions sharing a point of said dielectric block and three surfaces of B1, B2, B3 (hereafter called surfaces B) adjacent to each of the surfaces A respectively, in which an angle between 40 degrees and 50 degrees, both inclusive, is offered by said surfaces A and said surfaces B and an area ratio of said surfaces A with respect to said surfaces B and an area ratio of said surfaces A with respect to said surfaces B stands between 1% and 200%, both inclusive.

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9. (Previously Amended) A dielectric resonator comprising a dielectric block in the form of a generally rectangular parallelopiped having three-ridge portions chamfered thereof and generating TE₀₁ δ mode on electro-magnetically independent three surfaces of said dielectric block and having three surfaces A₁, A₂, A₃ (hereafter called surfaces A) formed by chamfering three ridge portions sharing an apex of said dielectric block, another three surfaces of A'₄, A'₅, A'₆ (hereafter called surfaces A') formed by chamfering three ridge portions sharing another apex on a diagonal line of said apex, another three surfaces of B'₁, B'₂, B'₃ (hereafter called surfaces B') adjacent to each of surfaces A and surfaces A' respectively and still another three surfaces of C'₁, C'₂, C'₃ (hereafter called surfaces C') adjacent to each of surfaces A and surfaces A' respectively, wherein an angle of 40 degrees through 50 degrees is offered by the surfaces A and B' or by the surfaces A' and C' and an area ratio of said surfaces A with respect to surfaces B' or an area ratio of said surfaces A' with respect to said surfaces C' stand between 1% and 200% both inclusive, respectively.

10. (Previously Amended) A dielectric filter using the dielectric resonator claimed in claim 8 or 9 characterized in that an angle between 40 degrees and 50 degrees, both inclusive, is offered by said three surfaces A or A' formed by chamfering three ridge portion sharing an apex of said dielectric block and other three surfaces B or B' adjacent thereto respectively and the surfaces A or A' and surfaces B or B' adjacent thereto respectively have three opposing surfaces of C₁, C₂, C₃ (hereafter called surfaces C) or the surfaces C' and characterized in providing a feeding probe near the surface B and B', the surfaces B' and B', the surfaces C and C', or the surfaces C' and C'.

11. (Original) A dielectric filter using the dielectric resonator claimed in claim 8 characterized in having said three surfaces A formed by chamfering three ridge portion sharing an apex of said dielectric block, another three surfaces B adjacent to said three surfaces A offering an angle between 40 degrees and 50 degrees, both inclusive, and three surfaces C opposing to said three surfaces B respectively, wherein a feeding probe is provided on the surfaces B and surfaces C.

12. (Previously Amended) A dielectric filter using the dielectric resonator claimed in claim 8, further comprising a feeding probe, characterized in that an angle offered by a direction p and p' of the feeding probe with respect to the x, y, z axes of said dielectric resonator are variable within the range between -45 degrees and +45 degrees, both inclusive, while in use.

13. (Original) A dielectric filter claimed in claim 11 characterized in that frequency and attenuation generating the attenuation pole at lower side band can be varied by varying a position for providing a feeding probe on said surface B and a position for providing a feeding probe on said surfaces C.

14. (Previously Amended) A dielectric filter claimed in claim 11, 12, or 13, wherein said feeding probe comprises a rod-type feeding probe.

15. (Canceled)

16. (Previously Amended) A dielectric filter using the dielectric resonator claimed in claim 7,

8, or 9, further comprising at least two or more of said dielectric resonators in said cut-off waveguide of a generally rectangular parallelopiped.

17. (Previously Added: PA) A dielectric filter claimed in claim 3 characterized in disposing a metal rod contacting with said cut-off waveguide b one end in parallel with a side surface of said dielectric resonator in the position distant by a predetermined amount from said side surface and having a composition in which resonant frequency of each resonance and an amount of coupling between resonators is adjustable.

18. (Previously Added: PA) A dielectric filter claimed in claim 1 characterized in installing another resonator further than said dielectric resonator in said cut-off waveguide

19. (Previously Added: PA) A dielectric filter claimed in claim 3 characterized in installing another resonator further than said dielectric resonator in said cut-off waveguide.

20. (Previously Added: PA) A dielectric filter claimed in claim 4 characterized in installing another resonator further than said dielectric resonator in said cut-off waveguide.

21. (Previously Added) A dielectric filter of claim 10, wherein said feeding probe comprises a rod-type feeding probe.

22. (Canceled)

23. (Previously Added) A dielectric resonator as claimed in claim 6, wherein said dielectric block further has a second set of three planes formed by chamfering another three ridge portions of said dielectric block, each said chamfered ridge of said second set of three chamfered ridges being opposite a respective one of said three chamfered ridges.

24. (Previously Added) A dielectric resonator as claimed in claim 6, wherein said three resonant modes are TE_{018} modes.

25. (Previously Added to Replace Original Claim 15) A dielectric filter described by claim 6, further comprising:

a feeding probe, wherein said feeding probe is loop-type.

26. (Currently Amended) A dielectric resonator, comprising:

a dielectric block having a generally rectangular parallelepiped shape,

wherein three resonant modes of said dielectric block are coupled,

wherein said dielectric resonator has a first plane formed by chamfering a single one of a ridge portion of said dielectric block and a second plane formed by chamfering a single one of a second ridge portion of said dielectric block, said first chamfered ridge portion not being parallel to said second chamfered ridge portion, said first chamfered ridge portion and said second chamfered ridge portion not crossing each other,

said first chamfered ridge being parallel to a y-axis, said second chamfered edge being parallel to a z-axis.

27. (Currently Amended) [A dielectric resonator as claimed in claim 26,] A dielectric resonator, comprising:

a dielectric block having a generally rectangular parallelepiped shape,

wherein three resonant modes of said dielectric block are coupled,

wherein said dielectric resonator has a first plane formed by chamfering a single one of a ridge portion of said dielectric block and a second plane formed by chamfering a single one of a second ridge portion of said dielectric block, said first chamfered ridge portion not being parallel to said second chamfered ridge portion, said first chamfered ridge portion and said second chamfered ridge portion not crossing each other, and

wherein a coupling amount of said three resonant modes of said dielectric block is varied by changing dimensions of said first plane and said second plane, respectively.

28. (Currently Amended) A dielectric filter, comprising:

at least one dielectric resonator including a dielectric block having a generally rectangular parallelepiped shape, wherein three resonant modes of said dielectric block are coupled, wherein said dielectric resonator has a first plane formed by chamfering a single one of a ridge portion of said dielectric block and a second plane formed by chamfering a single one of a second ridge portion of said dielectric block, said first chamfered ridge portion not being parallel to said second chamfered ridge portion, said first chamfered ridge portion being parallel to a y-axis, said second chamfered edge being parallel to a z-axis; and

a waveguide, wherein said at least one dielectric resonator is located in said waveguide.

29. (Previously Added) A dielectric filter of claim 28, wherein said at least one dielectric resonator comprises a dielectric resonator of a first type, said dielectric filter further comprising:

a dielectric resonator of a second type, said second type dielectric resonator being coupled to said at least one of said first type dielectric resonator.

30. (Previously Added) The dielectric filter of claim 29, wherein said second type dielectric resonator has a TEM mode and comprises a metal.

31. (Previously Added) The dielectric filter of claim 28, further comprising:

a partition comprising a conductive material separating two dielectric resonators in said waveguide.

32. (Previously Added) The dielectric filter of claim 28, further comprising:

a metal rod inserted between two dielectric resonators in said waveguide.

33. (Previously Added) The dielectric filter of claim 28, further comprising:

an exciting means as an input terminal; and

an exciting means as an output terminal.

34. (Previously Added) The dielectric filter of claim 33, wherein each of said exciting means comprises a rod-shaped antenna of which a head portion is open.

35. (Currently Amended) [The dielectric filter of claim 28, further comprising:] A dielectric filter, comprising:

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at least one dielectric resonator including a dielectric block having a generally rectangular parallelepiped shape, wherein three resonant modes of said dielectric block are coupled, wherein said dielectric resonator has a first plane formed by chamfering a single one of a ridge portion of said dielectric block and a second plane formed by chamfering a single one of a second ridge portion of said dielectric block, said first chamfered ridge portion not being parallel to said second chamfered ridge portion;

a metal rod inserted near one of said at least one dielectric resonator, wherein each resonant frequency of each said resonant modes and each coupling amount between said three resonant modes are adjusted by adjusting a length of said metal rod; and

a waveguide, wherein said at least one dielectric resonator is located in said waveguide.

36. (Currently Amended) ~~The dielectric filter of claim 28, further comprising:~~ A dielectric filter, comprising:

at least one dielectric resonator including a dielectric block having a generally rectangular parallelepiped shape, wherein three resonant modes of said dielectric block are coupled, wherein said dielectric resonator has a first plane formed by chamfering a single one of a ridge portion of said dielectric block and a second plane formed by chamfering a single one of a second ridge portion of said dielectric block, said first chamfered ridge portion not being parallel to said second chamfered ridge portion;

a waveguide, wherein said at least one dielectric resonator is located in said

waveguide; and

a dielectric member having a low dielectric constant, said dielectric member supporting said at least one dielectric resonator.

37. (New) A dielectric resonator comprising:

a dielectric block having a generally rectangular parallelepiped shape;

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a first chamfered edge on said dielectric block, said first chamfered edge being parallel to an x-axis of said block;

a second chamfered edge on said dielectric block, said second chamfered edge being parallel to a y-axis of said block; and

a third chamfered edge on said dielectric block, said second chamfered edge being parallel to a z-axis of said block,

wherein said first, second, and third chamfered edges mutually intersect in a first corner of said dielectric block.

38. (New) The dielectric resonator of claim 37, further comprising:

a fourth chamfered edge on said dielectric block, said fourth chamfered edge also being parallel to said x-axis;

a fifth chamfered edge on said dielectric block, said fifth chamfered edge also being parallel to said y-axis; and

a sixth chamfered edge on said dielectric block, said sixth chamfered edge also being parallel to said z-axis,

wherein said fourth, fifth, and sixth chamfered edges mutually intersect in a second

corner of said dielectric block, said second corner being diagonally opposite said first corner.

39. (New) A dielectric resonator comprising:

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a dielectric block having a generally rectangular parallelepiped shape, wherein three resonant modes of said dielectric block are coupled, said dielectric resonator has a first plane formed by chamfering a single one of a ridge portion of said dielectric block and a second plane formed by chamfering a single one of a second ridge portion of said dielectric block, said first chamfered ridge portion not being parallel to said second chamfered ridge portion.

40. (New) The dielectric resonator of claim 39, wherein a coupling amount of said three resonant modes of said dielectric block is varied by changing dimensions of said first plane and dimension of said second plane.

41. (New) A dielectric filter comprising:

at least one dielectric resonator including a dielectric block having a generally rectangular parallelepiped shape, wherein three resonant modes of said dielectric block are coupled, said dielectric resonator has a first plane formed by chamfering a single one of a ridge portion of said dielectric block and a second plane formed by chamfering a single one of a second ridge portion of said dielectric block, said first chamfered ridge portion not being parallel to said second chamfered ridge portion; and

a waveguide containing said at least one dielectric resonator.

42. (New) A dielectric filter comprising:

a waveguide;

at least one dielectric resonator of a first type located in said waveguide, said first type being a dielectric resonator including a dielectric block having a generally rectangular parallelepiped shape, wherein three resonant modes of said dielectric block are coupled, said dielectric resonator has a first plane formed by chamfering a single one of a ridge portion of said dielectric block and a second plane formed by chamfering a single one of a second ridge portion of said dielectric block, said first chamfered ridge portion not being parallel to said second chamfered ridge portion;

at least one dielectric resonator of a another type than said first type located in said waveguide, each said at least one dielectric resonator of another type being coupled to at least one of said at least one dielectric resonator of a first type.

43. (New) A dielectric filter according to claim 42, wherein at least one of said at least one dielectric of another type comprises a resonator having TEM mode and is comprised of a metal.

44. (New) A dielectric filter according to claim 41, wherein a partition is provided between said dielectric resonators, said partition being comprised of a conductive material.

45. (New) A dielectric filter according to claim 41, wherein a metal rod is inserted between said dielectric resonators.

46. (New) A dielectric filter according to claim 41, further comprising:

an exciting means used as an input terminal; and

an exciting means used as an output terminal.

47. (New) A dielectric filter according to claim 46, wherein each said exciting means comprises a rod-shaped antenna of which a head portion is open.

48. (New) A dielectric filter according to claim 41, further comprising:

a first metal rod inserted between two of said dielectric resonators; and

a second metal rod inserted near at least one said dielectric resonator, a length of said second metal rod providing an adjustment for a resonant frequency of each said three resonant modes, said length of said second rod additionally providing an adjustment for an amount of coupling between said three resonant modes.

49. (New) A dielectric filter according to claim 41, further comprising:

a support member for each said dielectric resonator, said support member comprised of a material having a low dielectric constant.

50. (New) A dielectric filter according to claim 42, wherein a partition is provided between said dielectric resonators, said partition being comprised of a conductive material.

51. (New) A dielectric filter according to claim 43, wherein a partition is provided between said dielectric resonators, said partition being comprised of a conductive material.

52. (New) A dielectric filter according to claim 42, wherein a metal rod is inserted between said dielectric resonators.

53. (New) A dielectric filter according to claim 43, wherein a metal rod is inserted between said dielectric resonators.

54. (New) A dielectric filter according to claim 42, further comprising:

an exciting means used as an input terminal; and

an exciting means used as an output terminal.

55. (New) A dielectric filter according to claim 43, further comprising:

an exciting means used as an input terminal; and

an exciting means used as an output terminal.

56. (New) A dielectric filter according to claim 42, further comprising:

a first metal rod inserted between two of said dielectric resonators; and

a second metal rod inserted near at least one said dielectric resonator, a length of said second metal rod providing an adjustment for a resonant frequency of each said three resonant modes, said length of said second rod additionally providing an adjustment for an amount of coupling between said three resonant modes.

57. (New) A dielectric filter according to claim 43, further comprising:

a first metal rod inserted between two of said dielectric resonators; and

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a second metal rod inserted near at least one said dielectric resonator, a length of said second metal rod providing an adjustment for a resonant frequency of each said three resonant modes, said length of said second rod additionally providing an adjustment for an amount of coupling between said three resonant modes.

58. (New) A dielectric filter according to claim 42, further comprising:

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a support member for each said dielectric resonator, said support member comprised of a material having a low dielectric constant.

59. (New) A dielectric filter according to claim 43, further comprising:

a support member for each said dielectric resonator, said support member comprised of a material having a low dielectric constant.

60. (New) A dielectric filter according to claim 44, further comprising:

a support member for each said dielectric resonator, said support member comprised of a material having a low dielectric constant.

61. (New) A dielectric filter according to claim 45, further comprising:

a support member for each said dielectric resonator, said support member comprised of a material having a low dielectric constant.

62. (New) A dielectric filter according to claim 46, further comprising:

a support member for each said dielectric resonator, said support member comprised

of a material having a low dielectric constant.

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63. (New) A dielectric filter according to claim 47, further comprising:

a support member for each said dielectric resonator, said support member comprised
of a material having a low dielectric constant.

64. (New) A dielectric filter according to claim 48, further comprising:

a support member for each said dielectric resonator, said support member comprised
of a material having a low dielectric constant.
